

WHAT IS CLAIMED IS:

- 1 1. A method for making a field emitter device comprising the steps of:
2 providing a substrate;
3 treating said substrate to modify a morphology of said substrate; and
4 growing a carbon film on said treated substrate.

- 1 2. The method as recited in claim 1, wherein only a portion of said substrate
2 is subjected to said treating step, and wherein said carbon film grown on said
3 treated substrate is a better field emitter than carbon film grown on an untreated
4 portion of said substrate.

- 1 3. The method as recited in claim 2, wherein said carbon film grown on said
2 treated portion of said substrate emits substantially more electrons when subjected
3 to a specified electric field than said carbon film on said untreated substrate.

- 1 4. The method as recited in claim 1, wherein said substrate is treated with a
2 base, wherein said treating step changes the chemical composition of said surface
3 of said substrate.

- 1 5. The method as recited in claim 1, wherein said substrate is treated with an
2 acid.

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- 1 6. The method as recited in claim 5, wherein said substrate is a ceramic.
- 1 7. The method as recited in claim 5, wherein said substrate is a metal.
- 1 8. The method as recited in claim 5, wherein said substrate is a glass.
- 1 9. The method as recited in claim 1, further comprising the step of performing
2 sonication on said substrate.
- 1 10. The method as recited in claim 3, wherein said substrate was not subjected
2 to a sonication step.
- 1 11. The method as recited in claim 1, further comprising the steps of:
2 depositing a metal layer on said substrate whereby said metal layer has a
3 predefined pattern so that a portion of said substrate is accessible through said
4 metal layer, wherein said depositing step is performed before said growing step.
- 1 12. The method as recited in claim 11, wherein said step of growing said
2 carbon film also deposits said carbon film on said metal layer, wherein said carbon
3 film is a continuous film.

1 13. The method as recited in claim 11, wherein said step of depositing said
2 metal layer on said substrate further comprises the steps of:
3 depositing said metal layer on said substrate;
4 patterning said metal layer using photolithography; and
5 etching said metal layer producing said predefined pattern.

1 14. A field emitter device manufactured by the following steps:
2 providing a substrate;
3 treating said substrate to modify a morphology of said substrate; and
4 growing a carbon film on said treated substrate, wherein only a portion of
5 said substrate is subjected to said treating step, and wherein said carbon film
6 grown on said treated substrate is a better field emitter than carbon film grown on
7 an untreated portion of said substrate, wherein said carbon film grown on said
8 treated portion of said substrate emits substantially more electrons when subjected
9 to a specified electric field than said carbon film on said untreated substrate.

1 15. The device as recited in claim 14, wherein said substrate is treated with an
2 acid.

1 16. The device as recited in claim 15, wherein said substrate is a ceramic.

- 1 17. A method for depositing a carbon film comprising the steps of:
2 depositing a metal layer on a substrate whereby said metal layer has a
3 predefined pattern so that a portion of said substrate is accessible through said
4 metal layer; and
5 depositing said carbon film on said portion of said substrate.
- 1 18. The method as recited in claim 17, wherein said step of depositing said
2 carbon film also deposits said carbon film on said metal layer.
- 1 19. The method as recited in claim 18, wherein said carbon film is a continuous
2 film.
- 1 20. The method as recited in claim 17, wherein said step of depositing said
2 metal layer on said substrate further comprises the steps of:
3 depositing said metal layer on said substrate;
4 patterning said metal layer using photolithography; and
5 etching said metal layer producing said predefined pattern.
- 1 21. The method as recited in claim 20, wherein said etching step roughens a
2 surface of said substrate at said portion of said substrate.

1 22. The method as recited in claim 21, wherein said substrate is a ceramic-like
2 material.

1 23. The method as recited in claim 17, wherein said step of depositing said
2 metal layer on said substrate further comprises the steps of:
3 etching said substrate, wherein said etching step changes the chemical
4 composition of said surface of said portion of said substrate; and
5 depositing said metal layer on said substrate through a mask producing said
6 predefined pattern.

1 24. The method as recited in claim 23, wherein said etching step roughens a
2 surface of said substrate.

1 25. The method as recited in claim 20, wherein said etching step changes the
2 chemical composition of said surface of said portion of said substrate.

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